

## ARISE - C-130 Hercules 09/15/14 Science Report

**Aircraft:**

[C-130H Hercules #439](#) ([See full schedule](#))

**Date:**

Monday, September 15, 2014

**Mission:**

ARISE

**Mission Location:**

Arctic Ocean

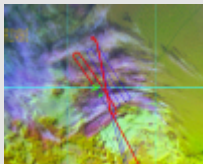
**Mission Summary:**

CERES Gridbox - Flt #9

The objectives for today's flight were to characterize the radiation budget of the upper atmosphere (the altitude ceiling of the C-130 at 22kft) and surface conditions with a high altitude lawnmower pattern in a 200x100 km region (centered near 75N 156W), to obtain a profile of atmospheric state and cloud properties, and to conduct a brief survey of the radiation budget near the surface. The flight scientist was Anthony Bucholtz (NRL). An initial profile from cruise altitude to the surface was conducted as the C-130 approached the area. Three cloud layers at approximately 18kft, 13kft and 1.5kft were penetrated, with layer thicknesses between 3000ft and 700ft. Once below the clouds the near-surface survey was conducted at 500ft as the C-130 flew diagonally across the grid box, sampling in, above and below the two lowest cloud layers, which the cloud probes indicated were primarily liquid. The surface was mostly sea-ice free here, with the occasional patch of broken sea ice. The C-130 then ascended to begin the high-altitude grid box survey at 22kft. On the first leg, a large amount of cirrus was encountered at flight level and above the altitude ceiling of the aircraft. For the CALIPSO underpass, the C-130 descended below the cirrus level (~12kft) and flew the leg between this cirrus layer and the midlevel layer below. In order to avoid optically thick cirrus along the planned flight track, the grid box was moved south-east based on coordination with the ground team and satellite imagery. The high altitude survey in this grid box was mostly free of cirrus, except for a leg that was interrupted by some thick cirrus that was cut short in order to avoid. This turned out to be a good grid box experiment for CERES over a thick and homogenous cloud deck. The C-130 data were acquired during 2 TERRA, 2 AQUA, 1 CALIPSO/CloudSat and 2 SNPP overpasses. All of the instruments were reported to work well.

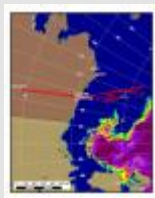
**Images:**

### September 15, 2014 Figure 1



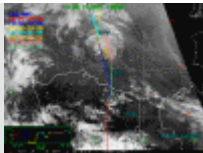
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### September 15, 2014 Figure 2



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### September 15, 2014 Figure 3



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## September 15, 2014 Figure 4



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## September 15, 2014 Figure 5



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**Submitted by:**

William L. Smith Jr. on 09/16/14

**Related Flight Report:**

## C-130 Hercules 09/15/14 - 09/16/14

**Flight Number:**

CERES Gridbox - Flight #9

**Payload Configuration:**

ARISE

**Nav Data Collected:**

Yes

**Total Flight Time:**

8.1 hours

**Submitted by:**

Martin Nowicki on 09/15/14

**Flight Segments:**

<b>From:</b>	PAEI	<b>To:</b>	PAEI
<b>Start:</b>	09/15/14 17:48 Z	<b>Finish:</b>	09/16/14 01:56 Z
<b>Flight Time:</b>	8.1 hours		
<b>Log Number:</b>	<a href="#">141002</a>	<b>PI:</b>	Christy Hansen
<b>Funding Source:</b>	Bruce Tagg - NASA - SMD - ESD Airborne Science Program		
<b>Purpose of Flight:</b>	Science		

**Flight Hour Summary:**

	141002	151004
<b>Flight Hours Approved in SOFRS</b>	229	
<b>Flight Hours Previously Approved</b>		88.7
<b>Total Used</b>	140.3	18.2
<b>Total Remaining</b>		70.5
<b>151004 Flight Reports</b>		

Date	Flt #	Purpose of Flight	Duration	Running Total	Hours Remaining
<a href="#">10/02/14 - 10/03/14</a>	Cal Flight	Science	8.6	8.6	80.1
<a href="#">10/04/14</a>	Transit	Transit	9.6	18.2	70.5

**Source URL:** [https://airbornescience.nasa.gov/science\\_reports/ARISE\\_-\\_C-130\\_Hercules\\_09\\_15\\_14\\_Science\\_Report?destination=node/24595](https://airbornescience.nasa.gov/science_reports/ARISE_-_C-130_Hercules_09_15_14_Science_Report?destination=node/24595)

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*Flight Reports began being entered into this system as of 2012 flights. If there were flights flown under an earlier log number the flight reports are not available online.*

#### 141002 Flight Reports

Date	Flt #	Purpose of Flight	Duration	Running Total	Hours Remaining
<a href="#">08/24/14</a>	Engineering Check Flight	Check	2.8	2.8	226.2
<a href="#">08/29/14</a>	Boom Calibration Flight	Check	0.5	3.3	225.7
<a href="#">08/30/14</a>	Project Check Flight	Check	5.2	8.5	220.5
<a href="#">09/01/14</a>	Transit (1 of 2)	Transit	8.7	17.2	211.8
<a href="#">09/02/14</a>	Transit (2 of 2)	Transit	6.6	23.8	205.2
<a href="#">09/04/14 - 09/05/14</a>	Arctic Ocean - Flight #1	Science	6.6	30.4	198.6
<a href="#">09/05/14 - 09/06/14</a>	140W Sea Ice - Flight #2	Science	7.1	37.5	191.5
<a href="#">09/06/14 - 09/07/14</a>	Ice ZigZag-Terra - Flight #3	Science	7.1	44.6	184.4
<a href="#">09/07/14 - 09/08/14</a>	CERES Gridbox - Flight #4	Science	8.4	53	176
<a href="#">09/09/14 - 09/10/14</a>	CERES Gridbox - Flight #5	Science	7.7	60.7	168.3
<a href="#">09/10/14 - 09/11/14</a>	MIZ Lawnmower - Flight #6	Science	8.8	69.5	159.5

<a href="#">09/11/14 - 09/12/14</a>	CERES Gridbox - Flight #7	Science	7.5	77	152
<a href="#">09/13/14 - 09/14/14</a>	CERES Gridbox - Flight #8	Science	8.3	85.3	143.7
<a href="#">09/15/14 - 09/16/14</a>	CERES Gridbox - Flight #9	Science	8.1	93.4	135.6
<a href="#">09/16/14 - 09/17/14</a>	Radiation Wall Pattern - Flight #10	Science	8.3	101.7	127.3
<a href="#">09/17/14 - 09/18/14</a>	CERES Gridbox - Flight #11	Science	7.2	108.9	120.1
<a href="#">09/18/14 - 09/19/14</a>	Sea Ice Albedo/CryoSat - Flight #12	Science	8.6	117.5	111.5
<a href="#">09/19/14 - 09/20/14</a>	Radiation Wall Pattern - Flight #13	Science	8.3	125.8	103.2
<a href="#">09/21/14 - 09/22/14</a>	Sea Ice & Radiation - Flight #14	Science	8.2	134	95
<a href="#">09/24/14 - 09/25/14</a>	Gridbox TOA+Surface - Flight #15	Science	6.3	140.3	88.7